The role of memory in cross-situational word learning: When referents go missing (#147734)

Author(s)
This pre-registration is currently anonymous to enable blind peer-review.
It has one author.

Pre-registered on:
2023/10/18 14:33 (PT)

1) Have any data been collected for this study already?
No, no data have been collected for this study yet.

2) What's the main question being asked or hypothesis being tested in this study?
In naturalistic language, the object referents of words are not always present in the visual scene (e.g. "Remember when we lost your ball?"). We assess adults' cross-situational word learning (CSWL) performance when a word's target referent is occasionally absent, either before or after learners have been exposed to the target word-referent mapping.

We then ask how well this pattern of performance is captured by two different models of CSWL: a hypothesis-testing model, Memory-Bound Pursuit (MBP) model (Soh & Yang, 2021; Yue et al 2023), and a global associative model, the Familiarity-Uncertainty based Global (FUbG) model (Kachergis et al 2012).

The word learning task has 3 blocks. The first block is a warm-up, in which participants are exposed to 10 words with a single exposure each. The second block (the target block) has 4 new words presented with 3 exposures each, and the third block has 10 words (the same as in the warm-up) presented with 2 exposures each (the "memory flush"–a set of new words to replace words in the ALS). The warm-up mitigates a primacy effect.

Following the learning task, participants are tested on all words in reverse block order with a forced choice task with 12 options. We predict that the learner will have a more difficult time recovering from an absent-referent trial when they do not yet have an established word-referent mapping, a prediction made by the MBP model.

3) Describe the key dependent variable(s) specifying how they will be measured.
Word learning accuracy on target block: performance at test on words encountered in the primary task's target word-learning block (specifically, whether the learner selects the target image that co-occurred with the word the most).

4) How many and which conditions will participants be assigned to?
This is a between-participant design, and the manipulation of interest is the placement of the absent-target exposure. There are two conditions: PPA and APP, where P indicates a present-target exposure and A indicates an absent-target exposure. The second P trial always confirms the participant's choice in the first P trial.

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.
We will be analyzing within-participant effects. Our primary analysis will be on the word learning accuracy on the primary task blocks. We will perform a binomial mixed effect regression on accuracy with condition as the main effect and with participant and item as random effects, with random slopes when possible and appropriate. The effect of primary interest is the main effect.

6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.
Participants will be asked at the end of the experiment if there is any reason their data should be excluded (e.g., they cheated or experienced technical difficulties), and we will exclude those who report their data should be discarded.
We include only items for which the target referent was selected in both P trials for the main analysis.

7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.
We plan to test 40 participants in each condition on Prolific.

8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)
We will in addition perform an error analysis. Do participants select prior hypotheses or other co-present objects that weren't previously selected?